

<p style="text-align: center;">IN THE UNITED STATES PATENT AND TRADEMARK OFFICE</p>	<i>Application Number</i>	10/671,086
	<i>Filing Date</i>	09/25/2003
	<i>First Named Inventor</i>	Charles W. Alvord
	<i>Group Art Unit</i>	3663
	<i>Examiner Name</i>	Daniel Lawson Greene
	<i>Attorney Docket Number</i>	2003P88063US (2436.191NPUS00)
<i>Title of the Invention: TANTALUM WATER TARGET BODY FOR PRODUCTION OF RADIOISOTOPES</i>		

AMENDMENT UNDER 37 C.F.R. § 1.114(c)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a submission under 37 C.F.R. § 1.114(c) in response to the final Office action mailed November 8, 2005. A Request for Continued Examination (RCE) is being filed simultaneously herewith. Further reconsideration of this application is requested in view of the following amendments and remarks.

AMENDMENTS TO THE SPECIFICATION:

--[0022] The above-mentioned features of the invention will become more clearly understood from the following detailed description of the invention read together with the drawings in which:

FIG. 1 is a front perspective view of a prior art target assembly;

FIG. 2 is a rear perspective view of the prior art target assembly;

FIG. 3 is a cross-sectional view of the prior art target assembly;

FIG. 4 is a front perspective view of one embodiment of a target assembly;

FIG. 5 is a cross-sectional view of one embodiment of a target assembly along the axis 5-5 as shown in Fig. 4; and

FIG. 6 is a cross-sectional view of the upper cooling channel and the target chamber.--

--[0024] FIGS. 4 and 5 illustrate one embodiment of the present invention. The target assembly 10 has a target body with a relatively solid outside surface with an upper flow channel 404 and a lower flow channel 406 through which cooling water can be provided. The target chamber 104' has a front window 310 approximating a one-quarter circle, and the target chamber 104' extends into the target assembly 10 with a sloping, or canted, rear wall 512 to allow for expansion of a vapor jet adjacent to the beam strike area 312 of the entrance window 310. The target liquid is introduced into the target assembly 10 through port 106, located at the lower portion of the target chamber 104' and extending into the front face 112 of the target assembly 10. The target assembly 10 contains the same inlet and outlet ports 220 and 222 as shown in Figs. 2 and 3.--

--[0028] The target assembly 10 includes a target chamber 104', which is filled with enriched water via an inlet port 220 on the back side 212, as shown in Fig. 3. The target chamber 104' is sealed with a window 310 adjacent the front face 112. The inlet port 220 feeds an inlet channel 106, through which the enriched water enters and fills the target chamber 104'. The air pushed out of the target chamber 104' exhausts through the outlet port 222. Before being irradiated, the enriched water completely fills the target chamber 104'. The accelerator beam strikes the target chamber 104' at a circular region 312 (the beam strike) in the lower portion of the chamber 104'. The beam heats the window 310 and the enriched water in the immediate vicinity of the window 310. The window 310 is typically Havar and is elevated to a high temperature by the beam. The window 310 transfers some of its heat to the water, which is also being heated by the beam. The enriched water experiences localized boiling adjacent to the window 310 at the beam strike area 312, which causes a jet of superheated steam to form. The jet moves upward, into a stable steam bubble in the top portion 514 of the target chamber 104'. The enriched water circulates in the target chamber 104' from the target strike area 312, to the top portion 514 of the target chamber 104', where it is condensed, down the back wall 512 and the side walls of the chamber 104' and toward the front window 310, where the enriched water re-enters the beam strike area 312 and is reheated, continuing the cycle.--.

CURRENT LISTING OF CLAIMS:

Claims 1-36 (Cancelled).

37. (New) A target assembly for containing and cooling enriched water for the production of fluorine-18, comprising:

a target body;

a target chamber formed within said target body, said target chamber having a front window for exposing said chamber to a particle accelerator, a rear wall opposite said front window, said rear wall being sloped with respect to said front window, and a top wall connecting said rear wall to said front window; and

a first cooling channel having a first cooling fluid inlet at one end of said target body, a first cooling fluid outlet at another end of said target body, and a first cooling fluid channel conduit formed in said target body coupling said first cooling fluid inlet with said first cooling fluid outlet, said first cooling fluid channel conduit running along at least a portion of said rear wall and along a portion of said top wall.

38. (New) A target assembly as set forth in claim 37, further comprising:

a second cooling channel having a second cooling fluid inlet at one end of said target body, a second cooling fluid outlet at another end of said target body, and a second cooling fluid channel conduit formed in said target body coupling said second cooling fluid inlet with said second cooling fluid outlet, said second cooling fluid channel conduit running substantially parallel to said first cooling fluid channel conduit.

39. (New) A target assembly as set forth in claim 37, wherein said target body is fabricated substantially from tantalum.

40. (New) A target assembly as set forth in claim 37, further comprising an enriched water inlet port formed in said target body, an enriched water inlet channel coupled between said target chamber and said enriched water inlet port, an enriched water outlet port formed in said target body, and an enriched water outlet channel coupled between said target chamber and said enriched water outlet port.

41. (New) A target assembly as set forth in claim 40, wherein said enriched water inlet port is located at an outer surface of said target body substantially parallel to said front window.

42. (New) A target assembly as set forth in claim 40, wherein said enriched water outlet port is located at an outer surface of said target body substantially parallel to said front window.

43. (New) A target assembly as set forth in claim 40, wherein said enriched water inlet port is located at an outer surface of said target body substantially parallel to said front window, and said enriched water outlet port is located at an outer surface of said target body substantially parallel to said front window.

44. (New) A target assembly for containing and cooling enriched water for the production of fluorine-18, comprising:

- a target body;

- a target chamber formed within said target body, said target chamber having a front window for exposing said chamber to a particle accelerator, a rear wall opposite said front window, said rear wall being sloped with respect to said front window, and a top wall connecting said rear wall to said front window;

- a first cooling channel having a first cooling fluid inlet at one end of said target body, a first cooling fluid outlet at another end of said target body, and a first cooling fluid channel conduit formed in said target body coupling said first cooling fluid inlet with said first cooling fluid outlet, said first cooling fluid channel conduit running along at least a portion of said rear wall and along a portion of said top wall; and

- a second cooling channel having a second cooling fluid inlet at one end of said target body, a second cooling fluid outlet at another end of said target body, and a second cooling fluid channel conduit formed in said target body coupling said second cooling fluid inlet with said second cooling fluid outlet, said second cooling fluid channel conduit running substantially parallel to said first cooling fluid channel conduit.

45. (New) A target assembly as set forth in claim 44, wherein said target body is fabricated substantially from tantalum.

46. (New) A target assembly as set forth in claim 44, further comprising an enriched water inlet port formed in said target body, an enriched water inlet channel coupled between said target chamber and said enriched water inlet port, an enriched water outlet port formed in said target body, and an enriched water outlet channel coupled between said target chamber and said enriched water outlet port.

47. (New) A target assembly as set forth in claim 46, wherein said enriched water inlet port is located at an outer surface of said target body substantially parallel to said front window.

48. (New) A target assembly as set forth in claim 46, wherein said enriched water outlet port is located at an outer surface of said target body substantially parallel to said front window.

49. (New) A target assembly as set forth in claim 46, wherein said enriched water inlet port is located at an outer surface of said target body substantially parallel to said front window, and said enriched water outlet port is located at an outer surface of said target body substantially parallel to said front window.

REMARKS

Claims 37-49 are now pending in this application, pursuant to the proposed amendment. Claims 1-36 have been cancelled. Further reconsideration of this application is requested.

In response to the objection to the specification under the first paragraph of 35 U.S.C. § 112, the rejection of claims 7, 8, 22-27, 29-31, 33 and 34 under the first paragraph of 35 U.S.C. § 112 as based on a non-enabling disclosure, the rejection of claims 1, 13 and 35 under the first paragraph of 35 U.S.C. § 112 as based on insufficient written description, the rejection of claims 10 and 32 under the first paragraph of 35 U.S.C. § 112 as based on lack of enablement, the rejection of claims 1-36 under the second paragraph of 35 U.S.C. § 112 as being indefinite, the rejection of claim 20 under the second paragraph of 35 U.S.C. § 112 as being incomplete, the rejection of claims 1-3, 7, 8, 10, 11, 13, 14, 17-20, 22-27, 32-34 and 36 under 35 U.S.C. § 102(b) as being anticipated by Erdman, U.S. Patent No. 6,586,747, the rejection of claims 1-5, 7-14, 17-20, 22-28 and 36 under 35 U.S.C. § 102(a) as being anticipated by the admitted prior art, the rejection of claims 1-4, 6-11, 13, 15-20, 22-29 and 32-36 under 35 U.S.C. § 102(b) as being anticipated by Satyamurthy et al., the rejection of claims 6, 16, 29 and 30 under 35 U.S.C. § 103(a) as being obvious over Erdman in view of Satyamurthy et al., and the rejection of claims 6, 16 and 29-31 under 35 U.S.C. § 103(a) as being obvious over the admitted prior art in view of Satyamurthy et al., claims 1-36 have been cancelled in favor of new claims 37-49.

Claims 37-49 have been drafted in light of the Examiner's comments concerning alleged lack of enabling disclosure, lack of sufficient written description, and indefiniteness, and the Examiner's comments regarding the prior art of record. Claims 37-49 are fully supported by the original specification as filed, clearly set forth the subject matter which Applicant regards as the invention, and clearly distinguish over the prior art of record.

In particular, claim 37 sets forth the novel features of the invention as disclosed in Fig. 5. Neither the admitted prior art of Figs. 1-3 nor Erdman nor Satyamurthy et al. disclose the features of a target assembly having a target body; a target chamber formed within said target body, said target chamber having a front window for exposing

said chamber to a particle accelerator, having a rear wall opposite said front window, said rear wall being sloped with respect to said front window, and having a top wall connecting said rear wall to said front window; and a first cooling channel having a first cooling fluid inlet at one end of said target body, a first cooling fluid outlet at another end of said target body, and a first cooling fluid channel conduit formed in said target body coupling said first cooling fluid inlet with said first cooling fluid outlet, said first cooling fluid channel conduit running along at least a portion of said rear wall and along a portion of said top wall, as set forth in claim 37.

The Erdman assembly includes a target cavity 60 formed in a target body 56. A front window 62 exposes the cavity to accelerated particles 17. A cooling block 68 is inserted into a receiving aperture 66 in the target body 56. A support portion 70 of cooling block 68 has support ribs 72 that engage a rear window 64 of the cavity 60 to form a cooling channel 74 adjacent to the rear window 64. Erdman fails to disclose 1) a target chamber having a front window for exposing said chamber to a particle accelerator and a rear wall opposite said front window being sloped with respect to said front window, and having a top wall connecting said rear wall to said front window; or 2) a first cooling channel having a first cooling fluid inlet at one end of said target body, a first cooling fluid outlet at another end of said target body, and a first cooling fluid channel conduit formed in said target body coupling said first cooling fluid inlet with said first cooling fluid outlet, said first cooling fluid channel conduit running along at least a portion of said rear wall and along a portion of said top wall, as set forth in claim 37.

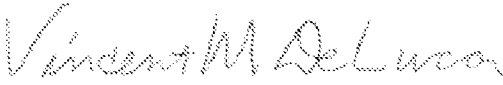
To the contrary, the cooling channel 74 is located adjacent to only a rear window 64 of the cavity 60. Further, the inlet and outlet ports 76 and 78 are located adjacent to each other on the same surface of cooling block 68. Claim 44 adds the requirement of a second cooling channel conduit, which also is not shown by Erdman.

Similarly, Satyamurthy also fails to disclose a target assembly as set forth in claims 37 or 44. Satyamurthy discloses a cooling water chamber directly behind a target chamber (see Fig. 1).

Conclusion

In view of the foregoing, further and favorable reconsideration of this application, withdrawal of all outstanding grounds of rejection, and the issuance of a Notice of Allowance are earnestly solicited.

Please charge any fee or credit any overpayment pursuant to 37 CFR 1.16 or 1.17 to Deposit Account No. 19-2179 in the name of Siemens Corporation.

RESPECTFULLY SUBMITTED,					
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